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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/645,879	08/22/2003	Mikio Yamazaki	1639.1035	8668

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EXAMINER	
DOTE, JANIS L	

ART UNIT	PAPER NUMBER
1756	

DATE MAILED: 12/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/645,879	YAMAZAKI, MIKIO	
	Examiner	Art Unit	
	Janis L. Dote	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3,4,9 and 11-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *3,4 and 11-13* is/are allowed.

6)☒ Claim(s) *9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. The finality of the rejection of the office action mailed on Sep. 7, 2005, is withdrawn.

2. The indicated allowability of claim 9 is withdrawn in view of the newly discovered reference(s) to Japanese Patent 03-010256. Rejections based on the newly cited reference(s) follow.

2. The amendment filed on Dec. 7, 2005, after the final office action mailed on Sep. 7 2005, has been entered. The examiner acknowledges the cancellation of claims 1, 2, 5-8, and 10 set forth in the amendment filed on Sep. 7, 2005. Claims 3, 4, 9, and 11-13 are pending.

3. The rejection of claims 1, 5, 7, 8, and 10 under 35 U.S.C. 112, first paragraph, set forth in the office action mailed on Sep. 7, 2005, paragraph 5, has been mooted by the cancellation of claims 1, 5, 7, 8, and 10 in the amendment filed on Dec. 7, 2005.

The rejections under 35 U.S.C. 103(a) of claims 1, 2, 5-8, and 10 over Japanese Patent 2002-107972 (JP'972), as evidenced by Grant & Hackh's Chemical Dictionary, page 277 and the CRC Handbook of Chemistry and Physics, 48th edition, page B-177,

combined with the other cited references, set forth in the office action mailed on Sep. 7, 2005, paragraphs 7-9, have been mooted by the cancellation of claims 1, 2, 5-8, and 10 in the amendment filed on Dec. 7, 2005.

3. The recitation "overlapping range in molecular weight distributions" in claim 3 is defined in the instant specification in paragraphs 0037-0040, when the conditions (1) or (2), as described in paragraphs 0039 and 0040, respectively, are satisfied.

In the response filed on Dec. 23, 2004, applicant stated that the conditions (1) and (2) disclosed in paragraphs 0037-0040 of the instant specification "when two molecular weight distributions are defined to be 'overlapping' are believed to be clear."

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,066,557 (Robinette) combined with: (1) Japanese Patent 03-10256 (JP'256), as evidenced by the Japanese Patent Office (JPO) English-language abstract and the

American Chemical Society (ACS) abstract, Acc. Number 1991:438641, both describing JP'256; and (2) US 6,355,390 B1 (Yamanami), as evidenced by applicant's admission that melamine is a thermosetting resin.

Robinette discloses an electrophotographic photoconductor comprising a conductive substrate having thereon in order a charge generation layer and a charge transport layer. The charge generation layer comprises a phthalocyanine compound and trigonal selenium particles as the charge generation material and "styrene-butadiene dimethylamino ethylmethyl acrylate" as the binder resin. See col. 3, line 62, to col. 4, line 5; col. 4, lines 34-52; and cols. 11-12, example 1. According to Robinette, a photoconductor comprising said charge generation layer comprising the styrene-butadiene binder resin and the combination of the trigonal selenium particles and the phthalocyanine has improved resistance to delamination, improved adhesion of the charge generation layer to the other layers, and exhibits uniform electrical properties. Col. 3, lines 39-46 and 58-61.

Robinette does not disclose that the exemplified styrene-butadiene copolymer in example 1 has the weight average molecular weight (Mw) or the ratio of the weight average molecular weight (Mw) to the number average molecular weight

(Mn) as recited in the instant claims. However, Robinette teaches that the styrene-butadiene copolymer preferably has a weight average molecular weight of about 50,000 to about 200,000 and an Mw/Mn ratio between about 3 to about 8. Col. 6, lines 58-62. The upper limit, "about 200,000," is within the weight average molecular weight range of "least 7.0×10^4" recited in instant claim 9. The upper limit, "about 8," meets the ratio Mw/Mn of at "least 4" recited in instant claim 9. Thus, Robinette teaches a binder resin having the molecular weight properties recited in instant claim 9.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Robinette, to use a styrene-butadiene copolymer having an Mw and an Mw/Mn ratio that are within the ranges recited in the instant claims as the styrene-butadiene copolymer binder resin in the photoconductor disclosed by Robinette. That person would have had a reasonable expectation of successfully obtaining an electrophotographic photoconductor having the benefits disclosed by Robinette.

Robinette does not exemplify a charge generation layer comprising an amorphous titanyl phthalocyanine in the amount as recited in instant claim 9. However, Robinette discloses that the phthalocyanine compound used in its charge generation

combination may be metal phthalocyanine particles, such as titanyl phthalocyanine. Col. 6, lines 62-67.

According to Robinette, it is well known in the art that trigonal selenium particles have "excellent sensitivity and good response to visible light"; while phthalocyanine pigments "exhibit good response to infrared light." Col. 2, lines 20-22 and 33-34. According to Robinette, the charge generation layer according to its invention has a broad spectral response in the infrared and visible light region. Col. 3, lines 46-49. Robinette teaches that the charge generation layer may comprise the charge generation combination of the trigonal selenium and the phthalocyanine in an amount of from about 5 to about 80 percent by weight dispersed in about 95 to about 20 percent by weight of the binder resin. Col. 7, lines 1-5. Thus, the weight ratio of the charge generation combination to the binder resin is (about 5 to about 80) to (about 95 to about 5), which encompasses the weight ratio range of 7/3 to 5/5 recited in instant claim 9. Robinette further teaches that the ratio of the trigonal selenium to the phthalocyanine may range from about 9:1 to about 1:9, and preferably is about 1:1. Col. 7, lines 9-11. Robinette teaches that the "specific proportions selected also depend to some extent on the thickness of the generating layer desired." Col. 7, lines 11-13. Robinette also

teaches that the charge generation layer may have a light radiation sensitivity between about 450 nm and 900 nm. Col. 7, lines 18-20. Thus, the prior art appears to recognize that the amount of the charge generation combination and the mixing ratio of the trigonal selenium and the phthalocyanine in the charge generation layer are result-effective variables. The variation of a result-effective variable is presumably within the skill of the ordinary worker in the art.

JP'256 teaches the use of an amorphous titanyl phthalocyanine comprising $\leq$ 0.2 wt% of chlorine as a charge generating material in an electrophotographic photosensitive body. See the JPO abstract, and JP'256 page 574. JP'256 teaches that the combination of its amorphous titanyl phthalocyanine with other charge generating materials is "equally satisfactory." JP'256 further teaches that the weight ratio of the amorphous titanyl phthalocyanine to binder resin is preferably 10 to 600 wt%. See the JPO abstract. JP'256 teaches that the photosensitive body can comprise a charge generation layer comprising its amorphous titanyl phthalocyanine and a charge transport layer. See the ACS abstract, and JP'256, page 580, figures 1-4. According to JP'256, when its amorphous titanyl phthalocyanine is used as charge generation material in

a photosensitive body, the photosensitive body has excellent electrostatic, sensitivity, and repetitive characteristics.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Robinette and JP'256, as evidenced by the JPO and the ACS abstracts, to use the JP'256 amorphous titanyl phthalocyanine as the phthalocyanine compound in the charge generation layer in the photoconductor rendered obvious over the teachings of Robinette, and to adjust, through routine experimentation, the amounts of the amorphous titanyl phthalocyanine and the trigonal selenium particles, within the teachings of Robinette, such that the resultant weight ratio of the amorphous titanyl phthalocyanine to the binder resin is within the ratio range of 7/3 to 5/5 as recited in instant claim 9; and such that the resultant amounts of the amorphous titanyl phthalocyanine and trigonal selenium particles provide a charge generation layer having a broad spectral response in the infrared and visible light region as taught by Robinette. That person would have had a reasonable expectation of successfully obtaining an electrophotographic photoconductor having a broad spectral response in the infrared and visible light region as taught by Robinette, and excellent electrostatic, sensitivity, and repetitive characteristics as disclosed by JP'256.

Robinette does not exemplify a photoconductor comprising an undercoat layer as recited in the instant claims. However, Robinette teaches "[i]f desired, any suitable charge blocking layer may be interposed between the conductive layer and the charge generation layer. Col. 5, lines 12-14. Robinette further teaches that "[s]ome materials can form a layer which function as both an adhesive layer and charge blocking layer. Typical blocking layers include . . . polyamides . . . and the like." Col. 5, lines 14-19.

Yamanami teaches that it is known in the art to use an undercoat layer between the electroconductive support and the photoconductive layer, for example, to improve the adhesion of the photoconductive layer to the support, to improve the coating characteristics and charging characteristics of the photoconductive layer, to inhibit unnecessary charges from injecting from the support into the photoconductive layer, and to compensate for any defects on the support. Col. 1, lines 25-36. Yamanami discloses a particular undercoat layer that is formed on a conductive substrate between the substrate and a photosensitive layer comprising in order a charge generation layer and a charge transport layer. The undercoat layer comprises untreated titanium oxide particles with a purity of 99.7 wt% dispersed in a crosslinked binder resin. The

undercoat layer is formed by coating a conductive substrate with a coating composition comprising the titanium oxide particles dispersed in a mixture of a methoxymethylated polyamide and a methylated melamine resin, and then heating the coated layer. Col. 5, lines 1-4, and example 22 at col. 50, line 41, to col. 51, line 31. The instant specification in paragraph 0030 discloses that the thermosetting resin includes melamine. Thus, the intermediate layer disclosed by Yamanami meets the undercoating layer compositional limitation recited in instant claim 9. According to Yamanami, a photoconductor, which comprises the Yamanami undercoat layer formed on the conductive support between the conductive support and the photosensitive layer, has high durability, and "constantly" provides "high quality images even though the photoconductor is repeatedly used under circumstances of high temperature and humidity or low temperature and humidity." Col. 4, lines 36-42, and Table 8 at col. 52, example 22. Yamanami further teaches that the photoconductor is "free from the occurrence of discharge breakdown, and the increase in residual potential," and can be manufactured at a low cost. Col. 4, lines 43-49.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Robinette and Yamanami, to use the Yamanami undercoat layer as the charge

blocking layer in the photoconductor rendered obvious over the combined teachings of Robinette and JP'256, as evidenced by the JPO and ACS abstracts. That person would have had a reasonable expectation of successfully obtaining an electrophotographic photoconductor that has high durability, that is "free from the occurrence of discharge breakdown and the increase in residual potential," and that "constantly" provides high quality images as disclosed by Yamanami.

6. Claims 3, 4, and 11-13 are allowable over the prior art of record, for the reasons discussed in the office action mailed on Mar. 25, 2005, paragraph 13, which are incorporated herein by reference.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mark Huff, can be reached on (571) 272-1385. The central fax phone number is (571) 273-8300.

Any inquiry of papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Claudia Sullivan, whose telephone number is (571) 272-1052.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through

Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JLD
Dec. 13, 2005

Janis L. Dote
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PRIMARY EXAMINER
GROUP ~~1500~~ 1700